Amendments to the Claims

1. (previously presented) A bonding apparatus for a wire bonding machine comprising:

a bonding tool coupled to an ultrasonic transducer , said transducer comprising:

a giant magnetostrictive element,

a fastener for holding the giant magnetostrictive element under mechanical pressure,

a first field generator for providing a magnetic bias field,

a second field generator for providing a magnetic drive field, and

a magnetic circuit for channelling the magnetic fields in the giant magnetostrictive element.

2. (previously presented) The apparatus of claim 1 wherein the giant magnetostrictive element is a rare-earth-alloy-based material.

3. (previously presented) The apparatus of claim 1 wherein the giant magnetostrictive element is Terfenol-D and its composites.

4. (previously presented) The apparatus of claim 1 wherein the giant magnetostrictive element is cylindrical with a central hole.

5. (previously presented) The apparatus of claim 1 wherein the giant magnetostrictive element is a composite comprising two or more rare-earth-based alloy parts separated from one another by a layer of passive polymeric material.

6. (previously presented) The apparatus of claim 1 wherein the fastener is a threaded shaft and a nut made of nonmagnetic metallic material.

7. (previously presented) The apparatus of claim 1 wherein the first field generator is a permanent magnet.

8. (previously presented) The apparatus of claim 1 wherein the second field generator is an electric coil.

9. (previously presented) The apparatus of claim 1 wherein the magnetic circuit comprises a pair of magnetic return-path rings and a magnetic return-path cylinder having high-permeability, high-resistivity and high-saturation.

10. (previously presented) A bonding apparatus for a wire bonding machine comprising:

a horn having a bonding tool at a smaller end and a mounting collar at an opposite end, and

an ultrasonic transducer coupled to the horn and comprising a giant magnetostrictive element, a fastener for holding the giant magnetostrictive element under mechanical pressure, a first field generator for providing a magnetic bias field, a second field generator for providing a magnetic drive field, and a magnetic circuit for channelling the magnetic fields in the giant magnetostrictive element.

11. (previously presented) The apparatus of claim 10 wherein the giant magnetostrictive element is a rare-earth-alloy-based material.

12. (previously presented) The apparatus of claim 10 wherein the giant magnetostrictive element is Terfenol-D and its composites.

13. (previously presented) The apparatus of claim 10 wherein the giant magnetostrictive element is cylindrical with a central hole.

14. (previously presented) The apparatus of claim 10 wherein the giant magnetostrictive element is a composite comprising two or more rare-earth-based alloy parts separated from one another by a layer of passive polymeric material.

15. (previously presented) The apparatus of claim 10 wherein the fastener is a threaded shaft and a nut made of nonmagnetic metallic material.

16. (previously presented) The apparatus of claim 10 wherein the first field generator is a permanent magnet.

17. (previously presented) The apparatus of claim 10 wherein the second field generator is an electric coil.

18. (previously presented) The apparatus of claim 10 wherein the magnetic circuit comprises a pair of magnetic return-path rings and a magnetic return-path cylinder having high-permeability, high-resistivity and high-saturation.